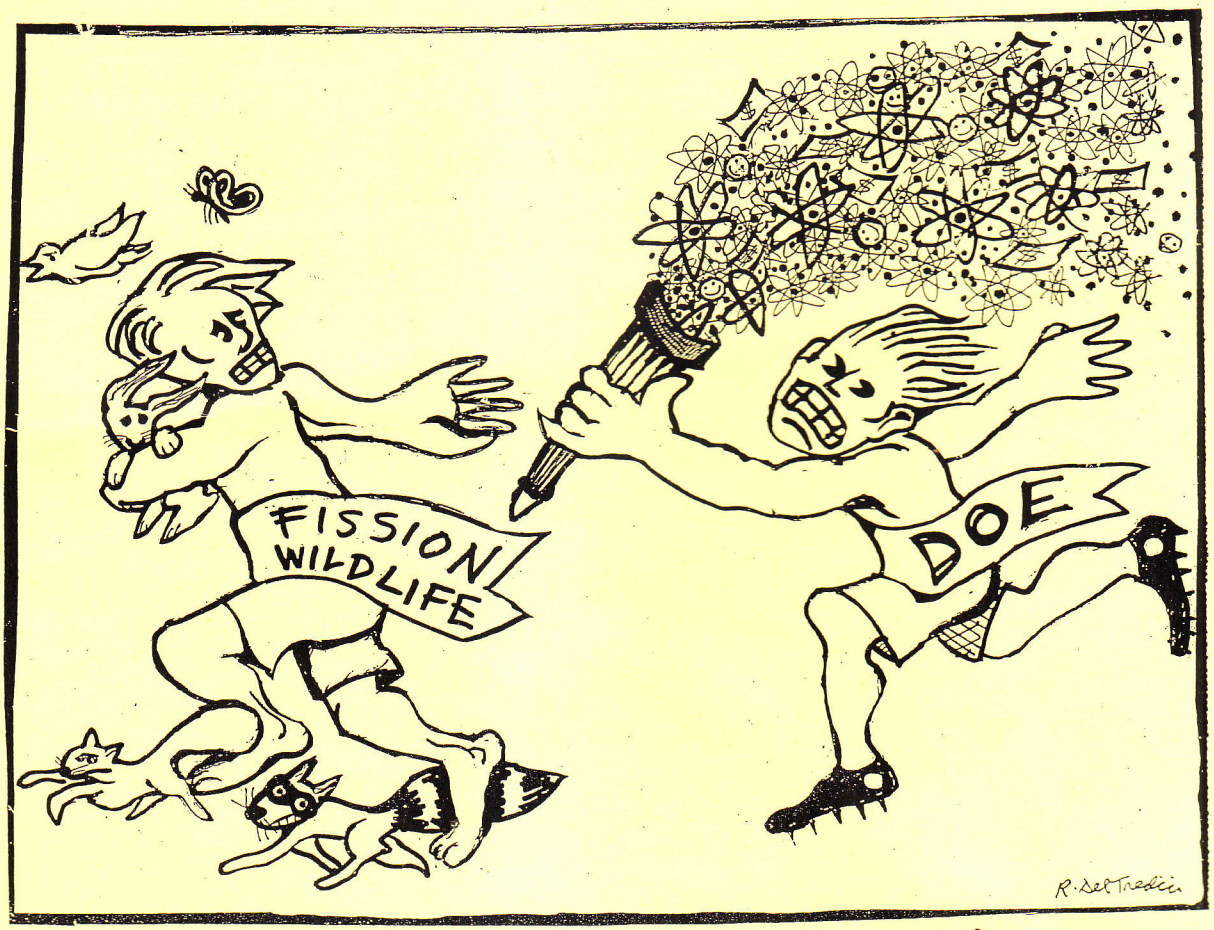
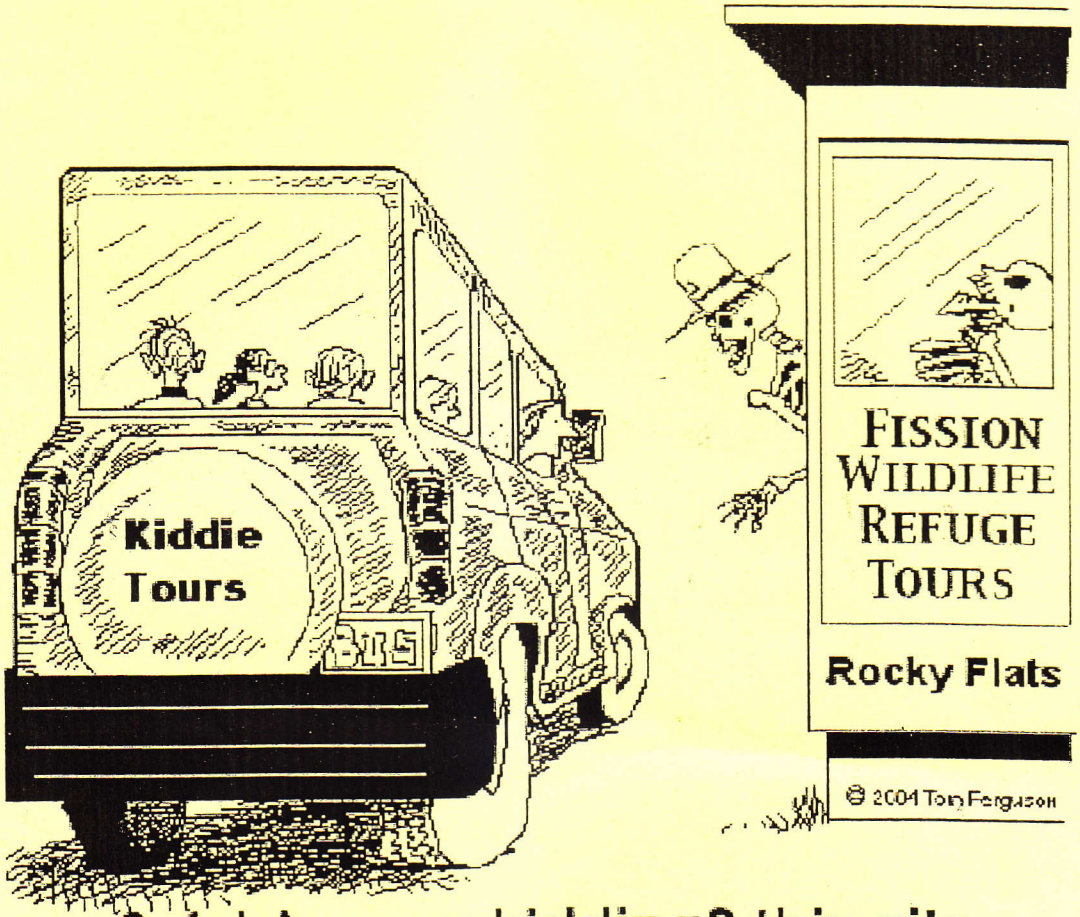
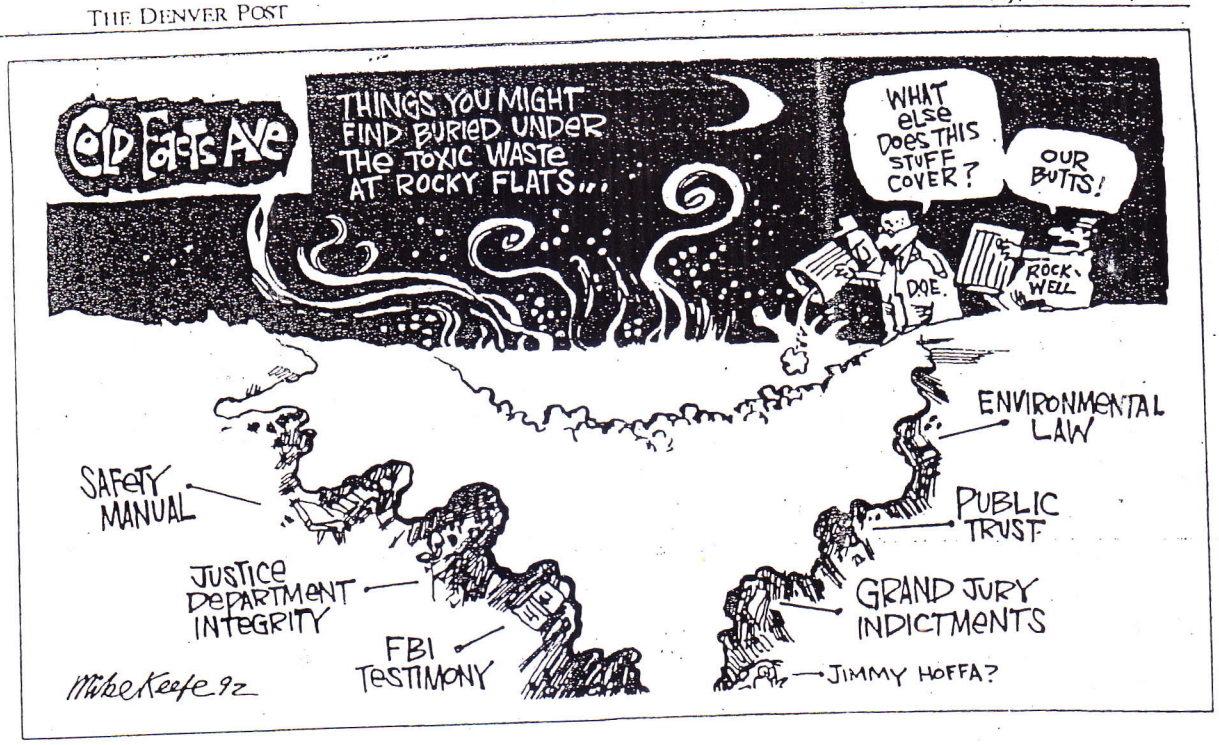
FISSION WILDLIFE TO RUN ROCKY FLATS AS A WILDLIFE REFUGE



Passing the torch



Safe! Are you kidding? this site is certified, clean as a whistle!


COLD FACTS AVE
THINGS YOU MIGHT FIND BURIED UNDER THE TOXIC WASTE AT ROCKY FLATS...
WHAT else DOES THIS STUFF COVER?
OUR BUTTS!
DOE
ROCK-WELL
ENVIRONMENTAL LAW
SAFETY MANUAL
PUBLIC TRUST
JUSTICE DEPARTMENT INTEGRITY
GRAND JURY INDICTMENTS
FBI TESTIMONY
JIMMY HOFFA?
MikeKeefe92

TOP TEN REASONS for NO PUBLIC USE of the Rocky Flats Wildlife Refuge

1. **The whole Rocky Flats site is contaminated.**
   Fires, accidents, routine operations, and random dumping during production years scattered plutonium across the whole of the 6,500-acre site. Additional toxins released include volatile organic compounds, heavy metals, beryllium, and other radionuclides. Each of these presents distinct dangers. Health effects of materials in combination are poorly understood.

2. **Plutonium in the environment is a permanent danger.**
   Plutonium has a half-life of 24,400 years; it remains dangerously radioactive for a quarter-of-a-million years. Tiny particles taken into the body may result in cancer, harm to the immune system, or pollution of the human gene pool. Particles left in the soil can be transported by human or natural processes. Some of what is left on the site may move off the site.

3. **No one knows how contaminated the site is.**
   The site has never been examined to determine the full extent of contamination. The "cleanup" will be completed without knowing whether there are undetected hot spots of various contaminants. Workers recently uncovered a buried incinerator three stories tall.

4. **A cheap cleanup endangers lives.**
   DOE and Kaiser-Hill made a closed-door deal with Congress to close Rocky Flats by a set date for a fixed sum, then tailored the cleanup to fit these limits, rejecting appeals that they seek more funds to do a better job. Of the $7 billion being spent to close the site by December 2006, no more than $470 million (about 7%) will be applied to cleaning the environment.

5. **The best possible cleanup is not happening.**
   The public has said that the ultimate goal should be cleanup to average background level, with current efforts going as far as possible in this direction. This is not happening. Instead, significant quantities of plutonium and other toxins are being left in the environment.

6. **Cleanup to wildlife refuge standards endangers future generations.**
   Rocky Flats will cease being a wildlife refuge long before plutonium left in the environment ceases being dangerous. What happens after fences fall and memory fades?

7. **Local people reject the cleanup being done.**
   85.6% of the individuals and organizations that commented on the Rocky Flats Cleanup Agreement proposed in late 2002 and adopted in June 2003 rejected the plan as inadequate. Their comments are part of the public record.

8. **Risk-based cleanup is dead wrong.**
   For the "risk-based cleanup" being done at Rocky Flats, risk is calculated by the government agencies to protect average humans, not those who are most vulnerable. Average people don't get sick and die; those who do include the very young, the very old, and the infirm. Fish and Wildlife Service (FWS) expects children and the disabled to visit the Rocky Flats site.

9. **Genetic effects of plutonium on wildlife are poorly understood.**
   Genetic effects on a given species may be so subtle that they cannot be easily detected until generations later when harm is irreversible. Any hurt to wildlife at Rocky Flats will not be confined to the bounds of the site.

10. **A contaminated environment is a high price to pay for open space.**
    DOE and FWS envision a Rocky Flats site with no fences or warning signs. To protect people from contaminants in the environment they will rely on institutional and physical controls (e.g., rules about use, barriers). The National Academy of Sciences says such controls will fail. Everyone wants open space; no one needs contaminated open space.

FOUR RECOMMENDATIONS
from the Rocky Mountain Peace and Justice Center on Future Use of the Rocky Flats Wildlife Refuge

a. MORATORIUM ON PUBLIC USE

Due to the contaminated conditions of the Rocky Flats site, the wildlife refuge should be declared off limits to the public for at least two centuries from establishment of the refuge.

b. RESEARCH ON HEALTH EFFECTS

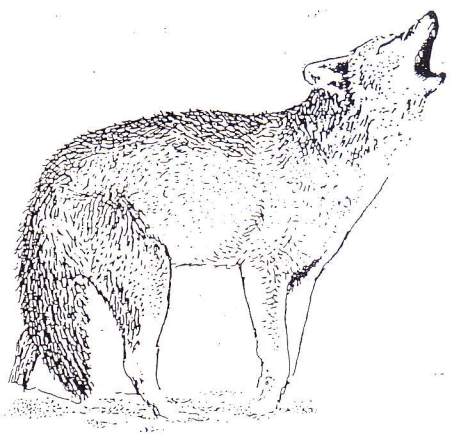
During the period of the moratorium, a comprehensive research program should be implemented to collect data on the plutonium body burden of wildlife on the site, on the basis of which extrapolations can be made to genetic effects on the wildlife and potential effects on humans at or near the site. A comprehensive program of this sort has never been done before; it can provide invaluable information not only for Rocky Flats but also for plutonium-contaminated sites elsewhere.

c. TECHNOLOGY DEVELOPMENT

U. S. Fish and Wildlife Service should work closely with the DOE's Legacy Management Office in implementing at Rocky Flats a program of ongoing research on promising technologies that can be applied at the site to reduce contamination with minimal ecological disturbance. Such a program could be carried out in conjunction with local universities and other research bodies.

d. CITIZEN OVERSIGHT

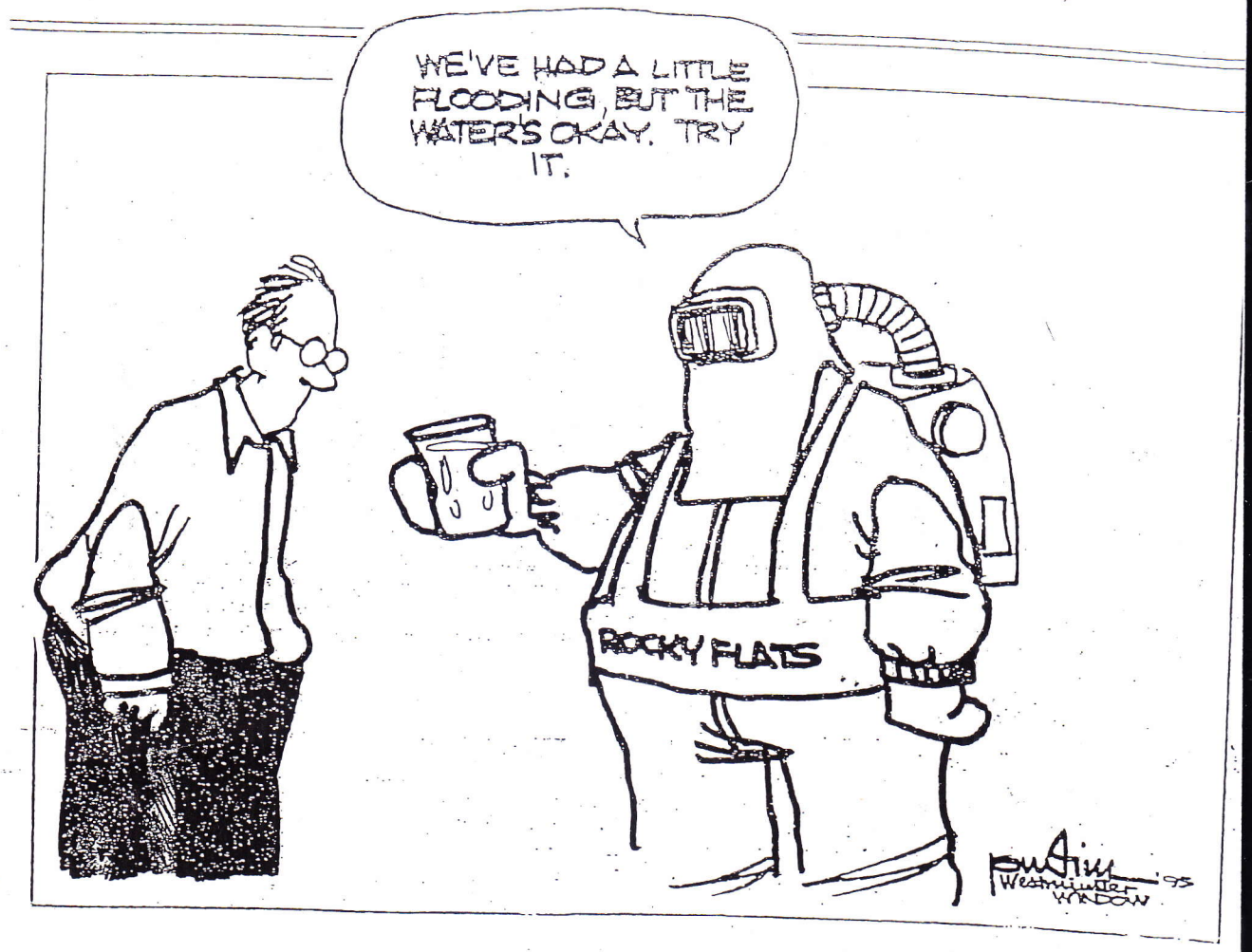
To oversee the foregoing, a broadly representative program of pubic oversight should be developed and implemented. The responsibility of the public overseers would be not simply to monitor and to guide what is being done but to keep the general public informed of conditions at the site, including results of research on both health and effects and on technology development.

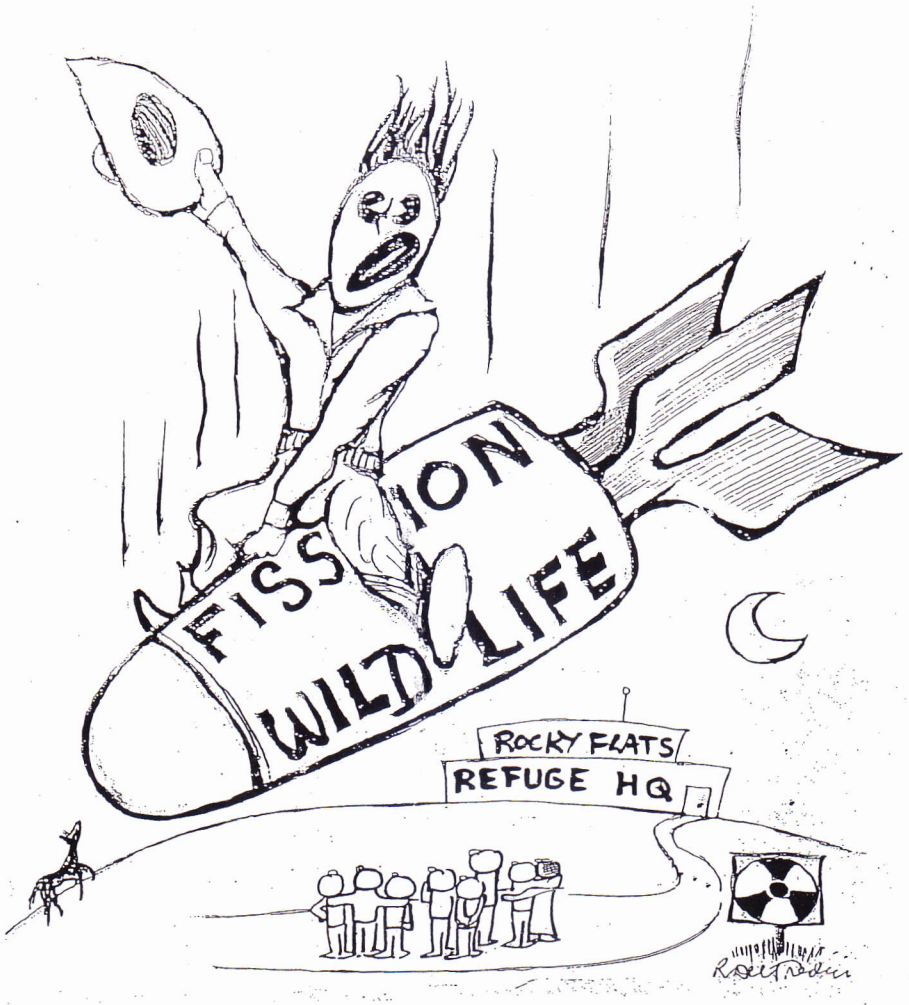


© Bob Savannah

"There goes the neighborhood."

August 3, 1995 — Westminster Window



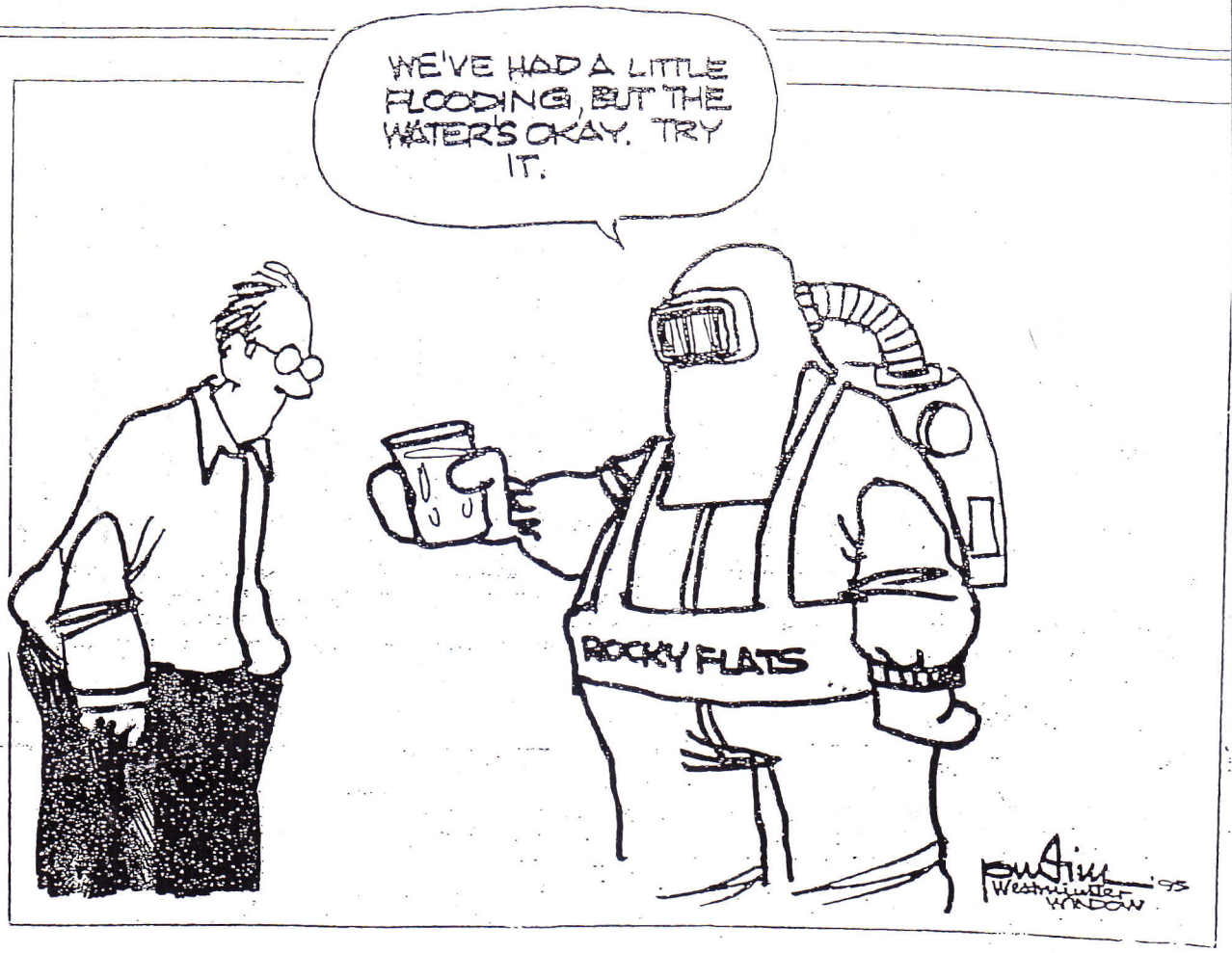


BOMBED AGAIN

The Rocky Mountain Arsenal Precedent

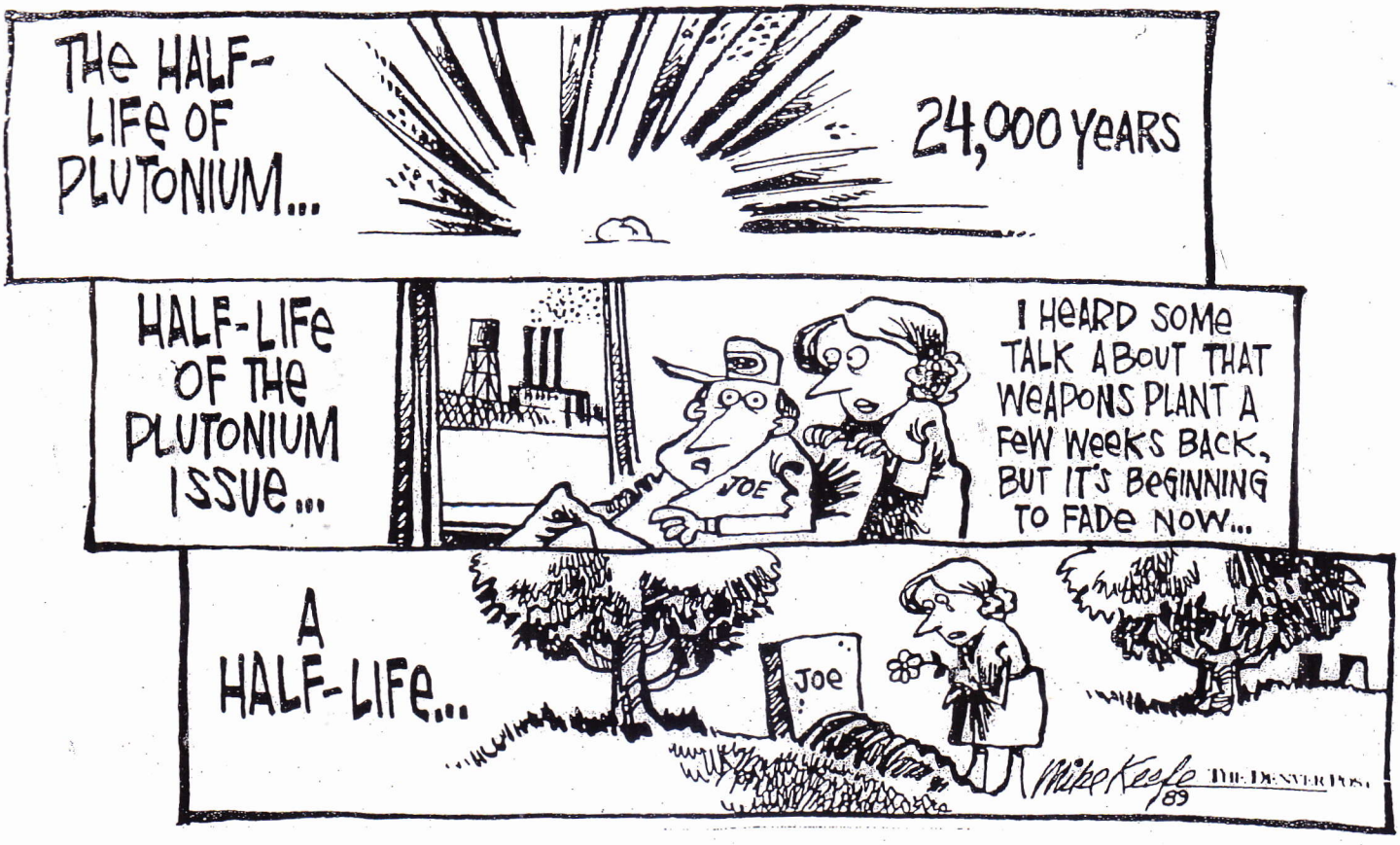
For about 50 years highly lethal nerve gas was made and stored at the Rocky Mountain Arsenal northeast of Denver. The Arsenal site is now operated as a National Wildlife Refuge by the U.S. Fish and Wildlife Service. School children routinely visit the site. In October-November 2000 and again in June 2001, several "bomblets" containing sarin nerve gas were unexpectedly found on the site. Though the public does not visit the area where the bomblets were fouund, this discovery is a reminder both that the Arsenal is contaminated and that no one really knows where contaminants may show up. While FWS may not be responsible for what remains in the environment, they are responsible for allowing public access.

August 3, 1995 — Westminster Window



ROCKY FLATS
News Flash
Hunting on site allowed for Youth and disabled using primitive weapons
R. DelTredici

The Denver Post
Tuesday, August 15, 1989

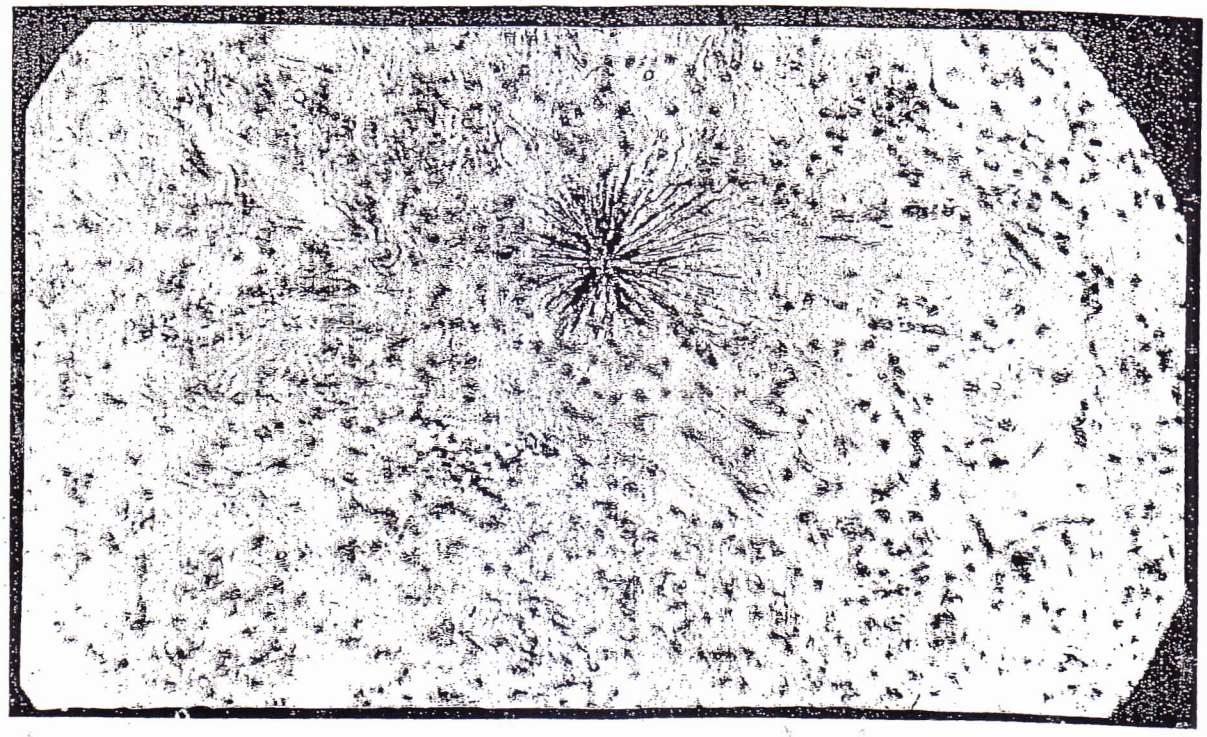

THE HALF-LIFE OF PLUTONIUM...
24,000 YEARS
HALF-LIFE OF THE PLUTONIUM ISSUE...
JOE
I HEARD SOME TALK ABOUT THAT WEAPONS PLANT A FEW WEEKS BACK, BUT IT'S BEGINNING TO FADE NOW...
A HALF-LIFE...
JOE
Mike Keefe '89
THE DENVER POST

Risk from Plutonium in the Environment at Rocky Flats

Prepared by LeRoy Moore, Ph.D., Rocky Mountain Peace and Justice Center (February 28, 2004)

• **Long-term danger:** Plutonium 239, the material of principal concern at Rocky Flats, has a half-life of 24,400 years. It remains dangerously radioactive for more than a quarter-of-a-million years. Left in the environment, it poses an essentially permanent danger.

• **Lethal quality:** The alpha radiation emitted by plutonium cannot penetrate skin like gamma radiation or x-rays. But tiny particles inhaled, ingested, or taken into the body through an open wound may lodge in the lungs or migrate to the liver or to the surface or marrow of bone. For as long as it resides in the body it continues to bombard surrounding tissue with radiation. The result may be cancer, genetic defects, harm to the immune system. The latent period for cancer is likely to be 20 to 30 years.



• **Plutonium particle in lung tissue:** "The black star in the middle of this picture shows the tracks made by alpha rays emitted from a particle of plutonium-239 in the lung tissue of an ape. The alpha rays do not travel very far, but once inside the body, they can penetrate more than 10,000 cells within their range. This set of alpha tracks (magnified 500 times) occurred over a 48-hour period" (Robert Del Tredici, *At Work in the Fields of the Bomb* [1987], plate 39).

• **Dangerous in very small amounts:** A single microgram of plutonium is "a potentially lethal dose" (F. Albert Cotton & Geoffrey Wilkinson, *Advanced Inorganic Chemistry*, 2nd ed., 1966, p. 1102). One microgram = 1/millionth of a gram. One ounce contains 31.1 grams, or 31.1 million micrograms. Particles of plutonium weighing 10 or less micrograms can be inhaled.

• **More harmful than other forms of radiation:** Internal alpha emitters like plutonium are much more harmful per unit dose than penetrating gamma or x-ray radiation. To account for the difference, the International Commission on Radiological Protection refers to the "relative biological effectiveness" (RBE) of alpha emitters. Looking at the potential harm to different organs and for different disease end-points, ICRP concludes that the average RBE for alpha emitters is 20. This means that, on average, internal alpha emitters are 20 times more harmful than penetrating radiation of the same dose. But because 20 is an average, for some body organs and certain cancers as well as particular individuals the actual RBE can be higher, sometimes much higher. For example, the RBE for bone cancer ranges as high as 320. (On RBE for plutonium, see Helen A. Grogan et al, *Assessing Risk of Exposure to Plutonium*, Feb. 2000 [Risk Assessment Corporation], pp. 6.27-6.39)

• **Incautious approach used in setting Rocky Flats cleanup standards:** Those who set the cleanup standards for Rocky Flats followed the ICRP in using 20 as the RBE for plutonium. This averaging approach disregards the harm that may result from plutonium exposure to certain organs of the body or to given individuals; it does not protect the most vulnerable members of the population. The Rocky Flats Cleanup Agreement allows 50 picocuries of plutonium per gram of soil to remain in surface soil after "cleanup," much larger quantities of plutonium at levels below three feet. Doubling the plutonium RBE to 40 would reduce the 50 picocuries allowed in surface soil to 25; each RBE doubling would halve the amount of plutonium allowed in the surface soil.

• **Potential harm to the human gene pool:** A British research team headed by Eric Wright concluded that the RBE for chromosomal damage from plutonium exposure is essentially "infinite," because the extent of harm to the human gene pool is incalculable (M. A. Khadim et al, *Nature*, vol. 355, no. 20 [Feb. 1992], pp. 738-740). The resultant "genomic instability" may account for illnesses other than cancer, illnesses so elusive that epidemiology is "powerless" to detect any relationship between their incidence and exposure to radiation (Rob Edwards, *New Scientist*, vol. 11, Oct. 1997, pp. 37-40).

• **Harm from a single particle:** Tom K. Hei and colleagues at Columbia University demonstrated that a single plutonium alpha particle induces mutations in mammal cells. Cells irradiated by very low doses of alpha radiation were more likely to be damaged rather than destroyed. Replication of these damaged cells constitutes genetic harm, and more such harm per unit dose occurs at very low doses than would occur with higher dose exposures. "These data provide direct evidence that a single alpha particle traversing a nucleus will have a high probability of resulting in a mutation and highlight the need for radiation protection at low doses." In a follow-up study, they found that "a single alpha particle can induce mutations and chromosome aberrations in [adjacent] cells that received no direct radiation exposure to their DNA" (*Proceedings of the National Academy of Sciences*, vol. 94 [Apr. 1997], pp. 3765-3770; and vol. 98 [4 Dec. 2001], pp. 14410-14415).

• **Excess cancers among Rocky Flats workers exposed to purportedly safe levels:** In 1987 Gregg S. Wilkinson of DOE's Los Alamos Lab published results of his study showing that some exposed Rocky Flats workers with internal plutonium deposits as low as 5% DOE's purportedly safe permissible lifetime body burden developed a variety of cancers in excess of what was normal for workers who had not been exposed (*American Journal of Epidemiology*, vol. 125, no. 2 [1987], pp. 231-250).

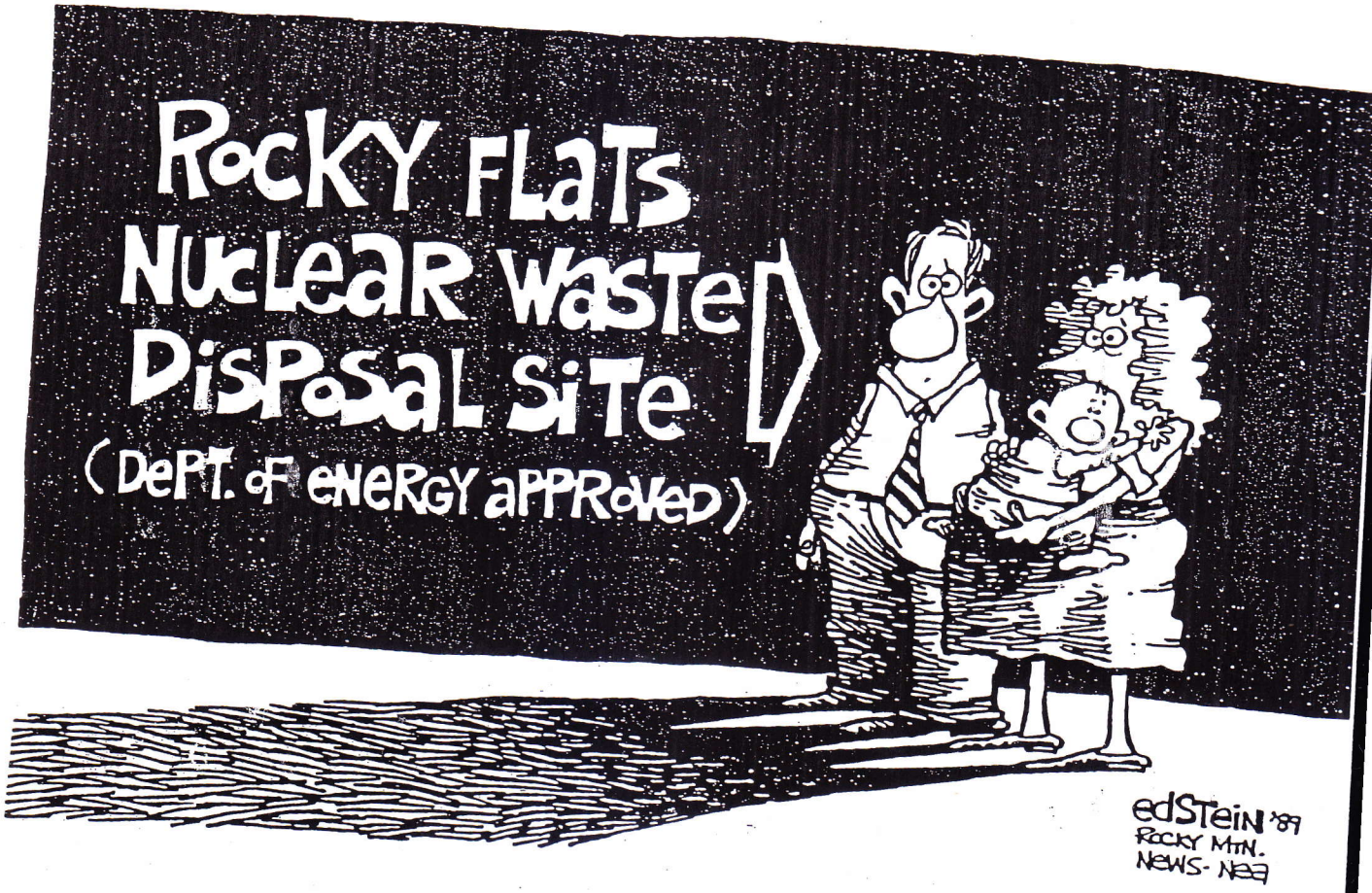
• **"Genetic uncertainty problem" for wildlife:** Diethard Tautz, a specialist on genetic effects, says that effects of radiation exposure on a given species of wildlife may not be readily apparent in the individuals of that species until the passage of several generations. He calls this a "genetic uncertainty problem" (*Trends in Genetics*, vol. 16 [Nov. 2000], pp. 475-477). His work suggests that the wildlife for which Rocky Flats will provide a refuge could in the long term be hurt more than helped by conditions at the site. Such hurt, of course, would not be contained within the bounds of the Rocky Flats site.

• **All the Rocky Flats site contaminated:** Historically, while certain parts of the Rocky Flats site were more heavily contaminated than others, plutonium particles released in fires, accidents, and routine operations were laid down across the whole of the site. This conclusion is supported by soil sampling done at predominantly upwind locations by Professors F. Ward Whicker of Colo. State Univ. and Harvey Nichols of the Univ. of Colo. The site's own 1999 map of plutonium distribution in surface soil supports rather than refutes this view.

• **Extent of contamination unknown, cleanup incomplete:** The government agencies responsible for cleanup of Rocky Flats never thoroughly "characterized" the Rocky Flats site to determine the full extent of contamination in the environment, and they have no plan to do so. They also are not cleaning the site to the maximum extent possible. Some plutonium and other toxins will remain in the environment.

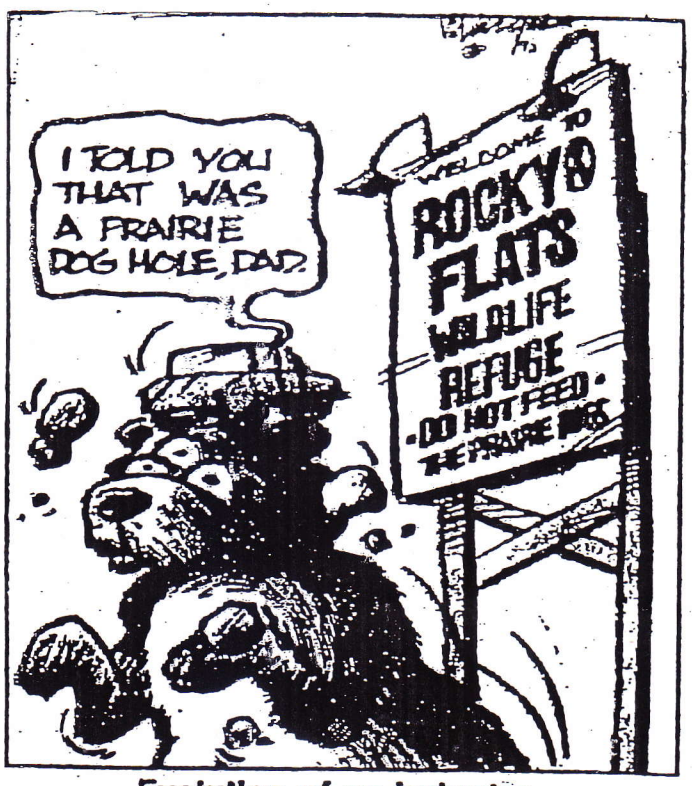
• **Harmful form of plutonium left behind:** Plutonium left in the Rocky Flats environment will be in the form of very fine particles that can be inhaled or ingested but that also can migrate. They can be moved by wind, water, plant processes, or by the actions of worms, insects, birds, animals, or humans. In the long-term future, human or animal activity or geophysical changes could bring to the surface plutonium left below the surface. There is no guarantee that plutonium left in the Rocky Flats environment will remain safely in place or even on the site.

Rocky Mountain News
1989



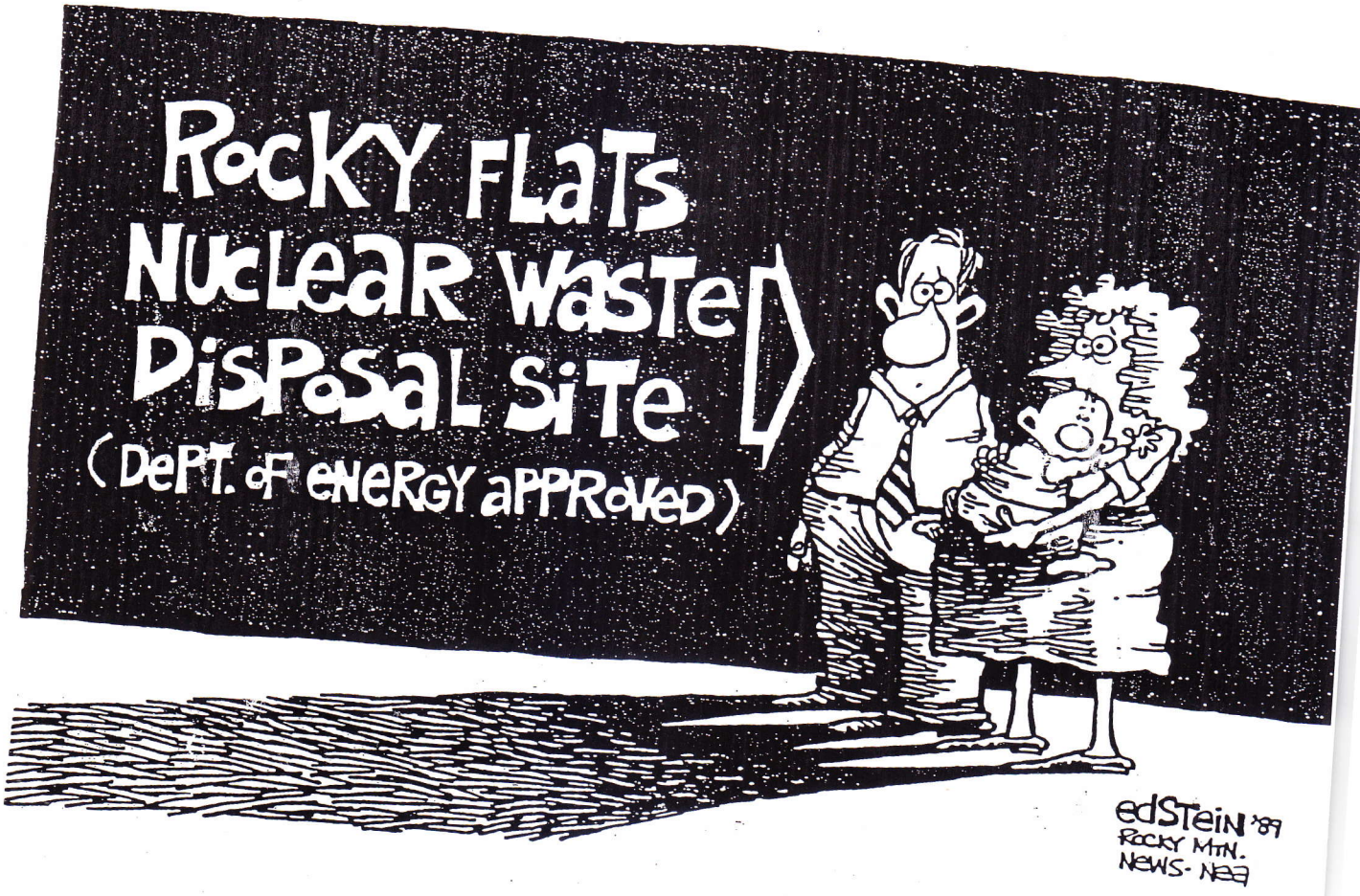
MODERN OXYGEN

By MARC A. VARGAS / Daily Camera



Evolution of an industry.

Rocky Mountain News
1989



How to Comment on the Rocky Flats National Wildlife Refuge Environmental Impact Statement

On Thursday, February 19, 2004, the U.S. Fish and Wildlife Service (FWS) published their Draft Comprehensive Conservation Plan and Environmental Impact Statement for the Rocky Flats National Wildlife Refuge (see at http://rockyflats.fws.gov). This document presents alternatives for managing the land and wildlife, including public access to the refuge. It essentially ignores the fact that the site will still be contaminated when FWS receives it from the Department of Energy. The public is invited to comment on what FWS proposes. The deadline for commenting is April 12, 2004. Comments may be made in person or in written form as follows:

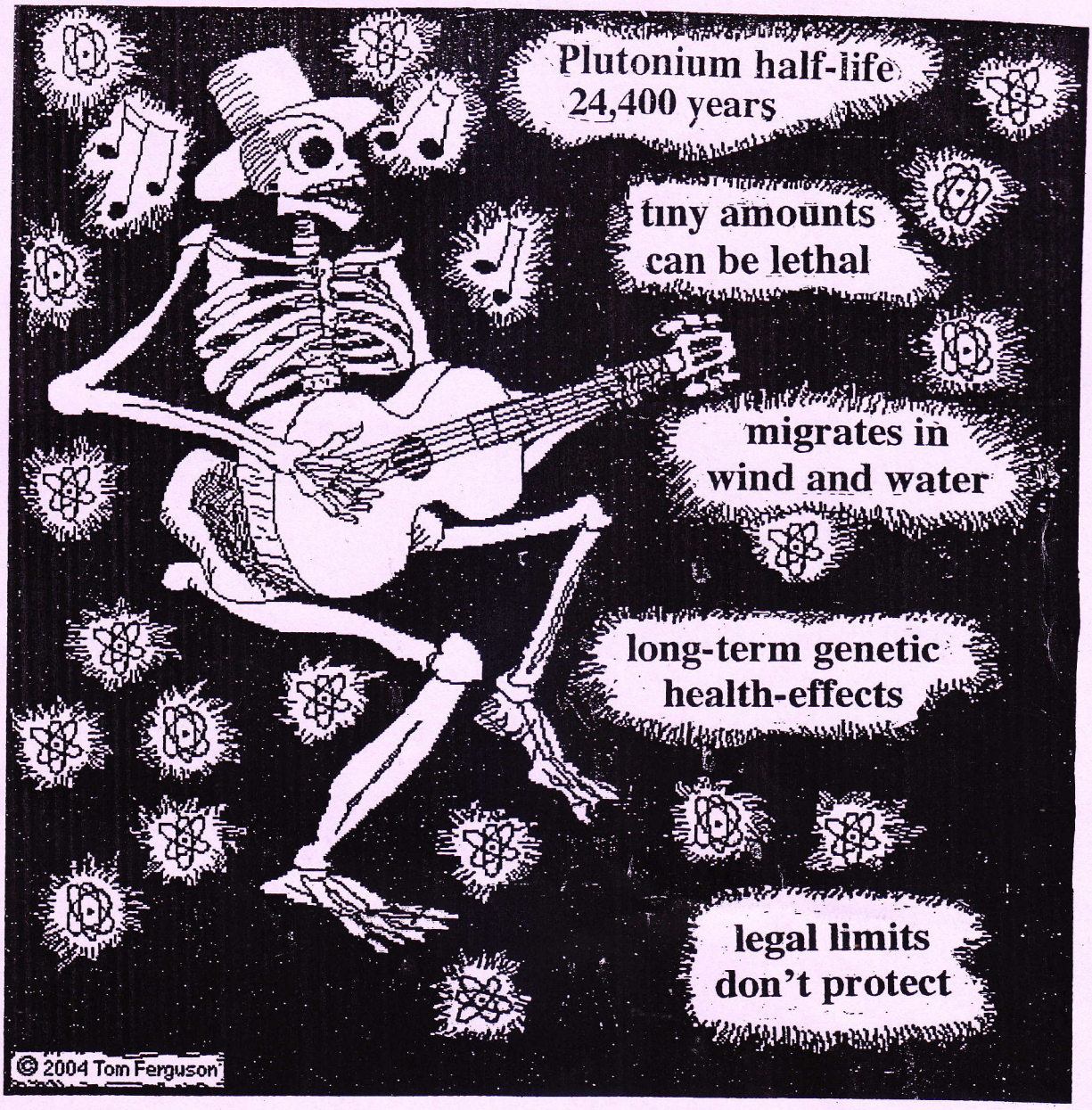
To comment in person, attend one of the following hearings *(comments are limited to 3 minutes per person)*

- Wednesday, March 10, 6:30-8:30PM: College Hill Library, Front Range Community College, 3645 W. 112th Ave. (east of Sheridan), Westminster
- Thursday, March 11, 6:30-8:30PM: East Boulder Recreation Center, 5660 Sioux Dr., Boulder
- Wednesday, March 17, 6:30-8:30PM: Arvada Center, 6901 Wadsworth Blvd., Arvada
- Thursday, March 18, 6:30-8:30PM: Broomfield Recreation Center, 280 Lamar St., Broomfield

Written comments may be submitted by mail, email, or fax as follows:

- By mail: Rocky Flats NWR
  Comprehensive Conservation Plan
  Attn: Laurie Shannon, Planning Team Leader
  U.S. Fish and Wildlife Service
  Rocky Mountain Arsenal NWR
  Building 121
  Commerce City, CO 80022
- By email: rockyflats@fws.gov>
- By fax: Rocky Flats NWR
  303-289-0579

For more information on the condition of the Rocky Flats site, see
http://www.rmpjc.org/2004/RockyFlatsWildlifeRefuge/
or contact Rocky Mountain Peace & Justice Center, 303-444-6981



Prepared by Rocky Mountain Peace and Justice Center
Box 1156, Boulder, CO 80304; 303-444-6981 (February 2004)
For more information, see http://www.rmpjc.org/2004/RockyFlatsWildlifeRefuge/